PROCEEDINGS AND REPORTS OF UNIVERSITIES, COLLEGES, COUNCILS, ASSOCIATIONS AND SOCIETIES

GREAT BRITAIN

BRITISH ORTHOPAEDIC RESEARCH SOCIETY

A meeting of the British Orthopaedic Research Society was held at Charing Cross Hospital on March 4, 1983, with the President, Professor R. G. Burwell, in the chair.

SCIENTIFIC PAPERS

A new aid in the diagnosis of congenital dislocation of the hip—*G. H. Cowie, B. A. Bogues, W. G. Kernohan* and *Professor R. A. B. Mollan* (Belfast) said that in a number of retrospective studies no decrease in the numbers of late (or missed) congenital dislocations of the hip had been shown despite adequate screening. The detection rate at birth depended on the experience of the examiner. In Belfast they had been developing a harmless, non-invasive method of detecting dislocating or subluxating hips which would provide an objective result. The method was based on the detection and analysis of the vibration-emission from neonatal hips during Ortolani's and Barlow's tests. Piezoelectric accelerometers attached to the skin detected the emission which was then amplified and recorded on magnetic tape. The emission was displayed by an ink-jet recorder to identify and isolate the various clunks and clicks. More sophisticated analysis was carried out on a spectrum analyser.

Four groups of children had been studied. Those with normal hips at birth, those referred with clicks, those with unstable hips at birth and those with a missed dislocation of the hip. The normal hips produced no significant vibration-emission. The clicks produced a high frequency signal which differed significantly from the low frequency signal of the clunk of neonatal instability and the low signal of a late dislocation being reduced at operation. Within the group referred with clicks a significant number had a low frequency signal similar to that of the unstable hip. These children subsequently developed a subluxation which required treatment.

This study had shown that it was possible to differentiate the click from the clunk in neonatal hips. It gave objective evidence for the first time that the click was not innocuous and indicated a group of children who might develop a subluxation in the first months of life.

The assessment of joint mobility in orthopaedic research—*J. C. T. Fairbank, P. B. Pynsent* and *H. Phillips* (Norwich) said that joint laxity was usually assessed by the criteria laid down by Carter and Wilkinson which relied on three out of five joints measured reaching a particular end point, and which were based on a study in young children up to the age of 12 years. In a study of pain in the adolescent knee and back Mr Fairbank and his co-workers had been unhappy in using these methods in older children, as considerable information was lost; dorsiflexion of the foot in particular was difficult to measure accurately. Accordingly, quantitative measurements of joint mobility had been made in the arms and legs of 446 adolescents aged between 13 and 18 years. In the upper limb abduction of the thumb, extension of the middle finger and of the elbow been measured and in the lower limb rotation of the hip tibia and extension of the knee had been recorded. They found that all the measurements were normally distrib except tibial rotation which was skewed; that all joints te to become less mobile with age over the sample measured, the exception of abduction of the thumb; that girls tended more mobile than boys, except for rotation of the hip extension of the finger where mobility was equal, and exter of the elbow where boys were more mobile; that extensi the elbow correlated poorly with the mobility of the other j measured, probably because the elbow has a bony sto extension; and that adolescents with low backpain had red mobility in the legs compared with pain-free controls, bu arms were normal. They concluded that whilst the meth Carter and Wilkinson was excellent for the clinical mea ment of joint hypermobility (except that extension of the el was unreliable) it was inappropriate for research purp where quantitative measurements should be used, and als the clinical assessment of joint hypomobility, which important in sporting injuries and low backache, and clinical implications in diabetes of juvenile onset.

"Dry joints" in divers: an explanation—*J. Pooley* and *Prof D. N. Walder* (Newcastle upon Tyne) said that divers o complained during compression of pain and limitatio movement in major joints, a condition known as "dry joi as, subjectively, the joints appeared to lack proper lubricat One explanation was that on exposure to compressed ai concentration of nitrogen in the blood rose above that of tissues, and synovial fluid was, therefore, drawn from the j cavity into the capillaries by "gas-induced osmosis".

While studying the effect of exposure to compressed ai circulation in both bone marrow and skeletal muscle in rabbit, using a xenon-133 clearance technique, it had t found that there was a transient increase in xenon-133 clear during compression and a decrease, or cessation, of clear beginning on decompression. As no change either in syste blood pressure or in intraosseous pressure had been foun was felt that these observed changes in xenon-133 clear rate could be more easily attributed to osmotically indu changes in capillary uptake of the isotope than to change blood flow. This idea had been tested by changing the toni of the arterial blood entering one limb by injection of ei hypertonic or hypotonic saline, while observing xenon- clearance from bone marrow and skeletal muscle. A trans increase in xenon-133 clearance from both these tissues occurred after hypertonic injection and a correspond reduction, or cessation, after hypotonic injection. These findi supported the hypothesis that the changes in isotope clear from bone marrow and skeletal muscle observed on compress and decompression occurred as a result of osmotically indu capillary uptake of the isotope. This was taken as evidenc "gas-induced osmosis" occurring *in vivo* and would support mechanism proposed above to account for the occurrenc "dry joints" in divers.

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